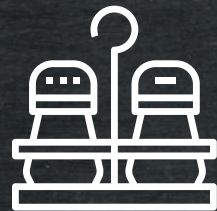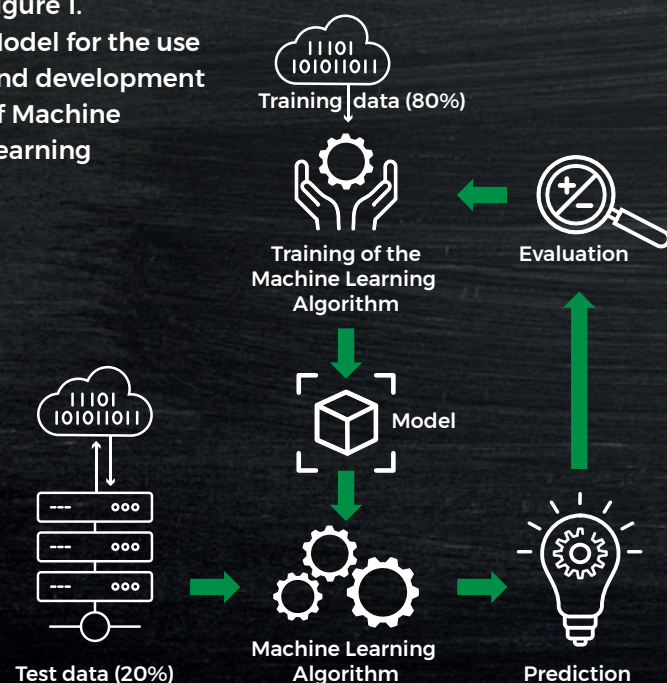# -Prepare-
YOUR OWN
TEACHING WITH AI

INGREDIENTS

✓ A clearly defined problem (at the level of the institution, study programme or course) with a clear objective for the AI application.

✓ Data: text, statistics, photos, audio or video clips or data from sensors, and preparation of this data.

✓ Machine learning and a model (Fig. 1).

Figure 1.
Model for the use and development of Machine Learning

Training data (80%)

Training of the Machine Learning Algorithm

Evaluation

Model

Test data (20%)

Machine Learning Algorithm

Prediction

METHOD

- **Decide on the level and purpose of the AI application**: Define the problem. Decide on the purpose and design the success criteria of the AI application.

- **Decide on the degree of control of the AI application and the lecturer**: How much control will the lecturer have and how much will be decided by the AI application? To help with this, use the model by Inge Molenaar (2021): six levels of automation in higher education (see Figure 2)

- **Prepare and collect the data**: Provide a clear description of the data you will need to make the AI application work. Divide your data into approximately 80% training data and 20% test data.

- **Model selection and training**: Build the AI application based on a model. Train the model using your training data, and test the model using your testing data.

- **Roll-out**: Take another thorough look at your AI application. Does the current prototype work? Does it solve the problem you defined at the start? How can it be rolled out? What will be needed? Adjust anything that needs adjusting.

VERSNELLINGSPLAN.NL

POINTS TO CONSIDER

- **Consider ethical aspects**: Apprise yourself of the risks around algorithmic bias, misinterpretation and privacy:
  - Data: the primary datasets used in the development and application of the algorithm.
  - Data processing: how does the system use the data?
  - Combating unequal treatment: how does the algorithm work to enforce equal treatment or does it combat unequal treatment?
  - Human oversight: to what extent do humans oversee the operation of the algorithm?
  - Risks and assurances: what risks does the use of the algorithm entail and what does the institution do to mitigate these risks?

- Building an AI application requires a lot of preparation. Design the application with a combined team which includes lecturers, educational IT professionals and data scientists.

- Professional development on the subject of AI could be organised in the form of a hackathon, for instance.
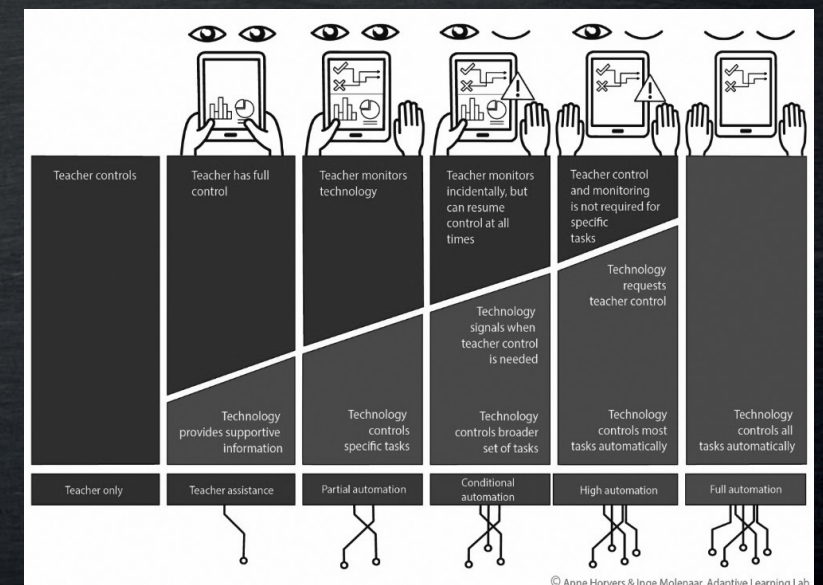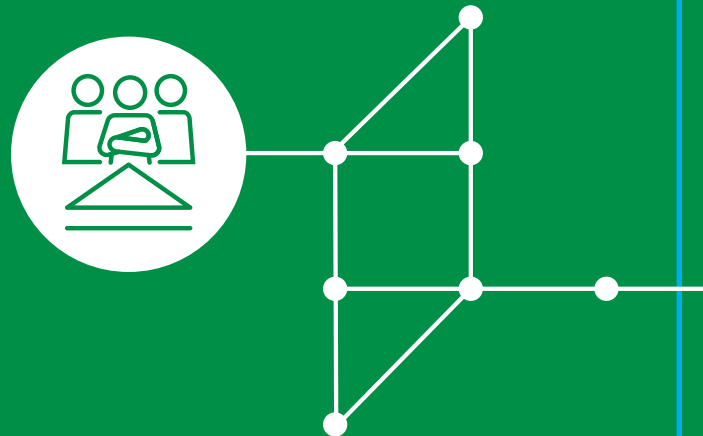
Figure 2. Six levels of automation of personalised learning (Molenaar, 2021)

Artificial intelligence (AI) is the science and engineering of making intelligent machines

What is AI?

The term "artificial intelligence" (AI) was introduced in 1956 by the scientist John McCarthy. He defined AI as 'the science and engineering of making intelligent machines'. There are now systems that can identify patterns in substantial amounts of data and that replicate human thinking and rational reasoning, such as generalising, arguing, interpreting and learning from the past. People can use these systems to perform all kinds of tasks and these systems can even take over certain tasks.

For more on AI, see:

What is Artificial Intelligence? (in Dutch)
What tools will you need? (in Dutch)
Building an AI application step by step (in Dutch)
AI in higher education (in Dutch)

Practical examples of AI in education

AI can provide support at the levels of the institution, study programme and course. A number of examples: :

✓ **AI for (formative) assessment**: an AI application that automatically provides feedback, groups students together, performs comparative assessments, and/or provides students with revision or in-depth resources (ACAWriter, Comproved).

✓ **Open educational resources**: Smart search technology can help provide access to, assign metadata to and classify open educational resources and other relevant information (EDIA Papyrus).

✓ **Automated feedback on writing assignments**: Based on 'recognition' and comparison of submissions from students (Sense, FeedbackFruits, Perusall, Sense).

✓ **Interactive tutors and personalised learning platforms**: students receive feedback on whether they are on the right track or not, they can ask for a nudge if they get stuck, and receive suggestions relating to their programme (Grasple, Labster).

✓ **To support self-study and research**: These may include functions such as transcribing interviews (Amberscript) or automatically summarising texts (Resoomer).

✓ **Online proctoring**: Digital administration of examinations where invigilation takes place using AI.

✓ **Information to students**: chatbots or personal assistants that can make personalised suggestions using AI technology (Genie).

We have included some of these tools in our *SURF list of online learning tools*. The list also includes background information on the legal frameworks and availability.

Want to discover more?

Work package for the field lab on AI in higher education

For more on AI, see:

Netherlands Court of Audit (2021). *Aandacht voor algoritmes.*

Castelvecchi, D. (2016). Can we open the black box of AI? *Nature*, 538, 20–23.

DS & AI (2020). Curriculum Development in Data Science and Artificial Intelligence. Deliverable 2.5: DS & AI Course Outlines.

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning.* Boston, MA: Center for Curriculum Redesign.

Kennisnet & SURF (2020). *Waardenkader voor onderwijs en onderzoek: Publieke regie op digitalisering.*

Molenaar, I. (2021). Personalization of Learning: Towards Hybrid Human-AI Learning Technologies. In *OECD Digital Education Outlook 2021: Pushing the frontiers with AI, blockchain, and Robots*, OECD, p. 57-77, Paris, France.

Netherlands AI Coalition (2019). *Mensgerichte artificiële intelligentie. Een oproep voor zinvolle en verantwoorde toepassingen.*

UNESCO (2019). *Beijing consensus on artificial intelligence and education.* Parijs, Frankrijk: United Nations Educational, Scientific and Cultural Organization.

Van der Vorst, T., Jelicic, N., de Vries, M., & Albers, J. (2019). De (on)mogelijkheden van kunstmatige intelligentie in het onderwijs. Utrecht: Dialogic.

Do you want to try AI too?

DeThis placemat has been prepared with the assistance of the AI field lab in the form of a hackathon. The manual for this hackathon can be downloaded from www.versnellingsplan.nl

Please let us know if you have any questions!
docentprofessionalisering@versnellingsplan.nl
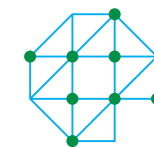
Acceleration plan
Educational innovation with ICT

Facilitating professional development of lecturers